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NOTES ON CALIFORNIAN UREDINEÆ AND DESCRIPTIONS OF NEW SPECIES.

W. R. DUDLEY AND C. H. THOMPSON.

PUCCINIA ANACHORETA Hark. Bull. Calif. Acad. Sc. 1:34. Feb. 1884.

II. Hypophyllous, sori scattered, sparse or abundant, small, .5-2 mm. long, oblong, surrounded by the ruptured epidermis, light yellow; spores globose, 18-23 μ in diameter, walls rather thick, finely echinulate.

III. Hypophyllous, sori like those of II but separate from them though on the same leaf, very dark brown; spores dark brown, broadly elliptical, not at all constricted, or slightly so, at the septum, the two cells of equal size with rounded base and apex, walls rather thick, uniformly covered with minute hyaline tubercles; 29-33 \times 34-40 μ ; pedicels hyaline, equaling the spore length, fragile, breaking away near the spore.

II. III. On leaves of Calochortus albus. Santa Cruz. May 1900. (Thompson).

This material was compared with the type material in the herbarium of the California Academy of Science and proved to be the same species with some variation in the size of the teleutospores. The original description gives the size as 20-24 \times 28-42 μ but on measuring some of the type material we found the spores to be 27.5-32.5 \times 31.2-37.5 μ . "Constricted" at the septum is certainly the exception and not the rule in both the type and in our own material. This adds the uredo stage to the published description.

PUCCINIA NODOSA Ell. & Hark. Bull. Calif. Acad. Sc. 1:27. Feb. 1884.

I. Amphigenous; spots oblong, 1-4 mm. long, conspicuous, orange-yellow; aecidia few, irregularly collected in groups, small, short, rising but slightly above the longitudinally split epidermis, borders very irregularly lacerated, not recurved; spores mostly globose, a few irregularly angular oblong to obovate, wall medium thick, very minutely tuberculate, 25-37.5 \times 25-37.5 μ .

II. Amphigenous; scattered, small, oblong, 1 mm. long, pustulate, opening by a single split in the epidermis parallel with the leaf, the epidermis crowded back by the protruding spores but not ruptured, dark chestnut-brown; spores globose, oblong to obovate, walls minutely and closely echinulate, yellow, contents finely granular, orange colored, germ-pores several, scattered over the spore, 30-32.5 \times 30-42.5 μ .

III. Amphigenous; sori mostly .5-1.5 mm. long, rarely 4 mm. long, by .5 mm. wide, pustulate, opening by a single longitudinal split, the epidermis crowded to either side, as a wall, by the protruding spores, black; spores mostly oblong to short ob-

long, rounded at base and apex though sometimes tapering in both, usually not constricted at the septum, occasionally slightly so, walls uniformly and moderately thick, very coarsely tuberculate, almost opaque black, $26.2-37.5 \times 47.5-70 \mu$; pedicel thick, half the length of the spore, hyaline, deciduous. Paraphyses present at border of sorus, irregularly bent clavate, hyaline.

The above description is made entirely from our own material and adds stages I and II to the published description. This material was compared with the type material in the Harkness herbarium of fungi in the California Academy of Science and found to be identical with it. Owing to the meagreness of the type material only a small number of spores could be examined. These measured $30-35 \times 43.7-50 \mu$, while in the original description they are given as $22-28 \times 36-42 \mu$. "Septum scarcely visible" was probably due to the almost opaque condition of the cell wall. The pedicel is also described "as long as the spore." A number of sections through the leaf of our material, having the spores attached, failed to show any equaling the spore length but all were quite uniformly half the length of the spore.

I. II. On *Brodiaea capitata*. Rocky point near Searsville Lake, San Mateo County. Jan. 24, 1904. (Thompson).

III. Same host and location as I. and II. April 19, 1903. (Thompson).

Puccinia moreniana Dudley & Thompson n. sp.

III. Hypophyllous; sori scattered, pustulate, round to long-oblong, $1-3 \times 1-12$ mm., for some time covered by the epidermis which at length breaks away irregularly, leaving the sori naked, pulverulent, chestnut-brown; spores very irregular in size and frequently so in shape, the more common form being oblong with rounded or obliquely tapering apex and rounded or tapering base, moderately constricted at the septum, $16.2-21.2 \times 30-40 \mu$, averaging $19 \times 35 \mu$. Variations in length and diameter give a measurement range of $16.2-25 \times 30-43.7 \mu$. Unicellular spores of various sizes and shapes are frequent. All spores are light brown, walls thin throughout, smooth; pedicel long, $30-60 \mu$, tapering, rough, fragile, readily breaking away at the spore.

On *Brodiaea capitata*, by the old cement mill, Searsville Lake, at the base of Sierra Morena, San Mateo County. April 19, 1903. (Thompson).

Puccinia monardellae Dudley & Thompson n. sp.

I. Causes a swollen distortion of the young twigs, either the whole or only the basal portion of the twig, the leaves on these parts correspondingly distorted; over the surface of both are scattered the aecidia; the swollen twigs have a purple epidermis; aecidia long and slender cylindrical with irregularly lacerated margins which are not recurved; spores irregularly angular, globose to oblong, very minutely and closely verrucose, con-

tents granular with conspicuously large oil globules, 16.2-25 x 23.7-38.7 μ .

II. Hypophyllous, sori round, scattered, pale tawny yellow, small; spores globose to slightly angular, almost hyaline, minutely and sparsely echinulate, thin walls, contents granular, 22.5-25 μ in diameter.

III. Hypophyllous, sori round, small, scattered or occasionally forming rings, black, pulverulent; spores very dark reddish brown, short elliptical, slightly or more usually not at all constricted at the septum, rounded at both base and apex, cells equal in size, walls rather thick, closely beset over both cells with medium large transparent papillae, 22.5-25 x 25-31.2 μ ; pedicel stout, hyaline or sometimes slightly colored next the spore, spatulate flattened near the base, about 5 μ in diameter by 50-62.5 μ long.

This species shows relationship to *P. menthae*, but a comparison of it with abundant material of the latter from both America and Europe shows many conspicuous and constant differences which readily separate it from that species,—the very dark brown teleutospores, the dense covering of papillae on the basal cell as well as the apical one, the absence of any prominent apical papilla, and the stout pedicel which is comparatively short and conspicuously spatulate flattened near the basal end.

On *Monardella villosa*, Santa Cruz, June-July 1902-3. (Thompson.) Searsville ridge, San Mateo County, Jan., Mar. 1903. (Thompson.) *M. undulata*, Point Reyes, July 1903. (Elmer.) Distributed under *Puccinia menthae* Pers. in *Fungi Columbiani*, no. 188 b, on *Monardella villosa*, Berkeley, June 1893. (Blasdale).

PUCCINIA MICROMERIAE Dudley & Thompson n. sp.

I. Aecidia closely scattered on under surface of the leaves and along the stem, diminishing the former in size and causing the latter to grow strictly erect (the normal branches being prostrate trailing); basal portion of the aecidia hemispherical, from the top of which extends the long white cylinder, 3-4.5 x 5.6-10.5 mm. irregularly jagged on the margin, not revolute, readily breaking away so that older individuals are much shorter; spores angular ovoid, oblong or globose hyaline, walls medium thick, minutely and closely verrucose, 16.2-21.2 x 25-32.5 μ .

II. Hypophyllous; sori scattered or clustered, in the latter case somewhat discoloring a spot on the leaf to straw-yellow, small, round, pale pinkish yellow, fading on drying; spores mostly elliptical-oblong, frequently ovoid, nearly transparent, wall thin, finely echinulate, contents granular, 18.7-21.2 x 25-30 μ .

III. Sori mostly on the angles of the trailing stems from which grow the distorted branches which bear the aecidia, rarely found on the under surface of the leaf on the veins, very small, 1.1-1.9 x 3-3.7 mm., dark brown, surrounded by ruptured epi-

dermis, spores very free (not crowded); spores reddish-brown, oblong, very slightly constricted at the septum, the two cells equal in size, walls thick, verrucose over the terminal cell and about half way down on the basal cell, base and apex round, a large low apical papilla frequently present but not at all conspicuous, $24-27.5 \times 29-34 \mu$; pedicel hyaline, tapering downward, $37.5-44 \mu$ long, fragile, usually breaking off to about the length of the spore.

Allied to *P. menthae* but differing in the aecidial stage in the strictly erect form of the distorted branches of the host, and the bulbous base of the aecidia; in the uredo stage in oblong spores, never globose; in the teleuto stage in the thick wall which is more thickly verrucose, the less prominent apical papilla, less marked constriction at the septum and greater size of the spores.

I. II. III. On *Micromeria chamissonis*, Santa Cruz, June-July, 1903. I. and II. very abundant, III. rarely found. (Thompson); II. Big River, Mendocino County, June 14, 1903. (McMurphy.)

UROMYCES ATRO-FUSCUS Dudley & Thompson n. sp.

I. Amphigenous; spots small, pale yellow; sori round to short elliptical, scattered or clustered but not at all confluent, standing out prominently from the host, brown-black.

II. Spores scattered among the teleutospores, not abundant, elliptical, $16-17.5 \times 25-26 \mu$, rather thickwalled, echinulate, germ-pores conspicuous, equatorial.

III. Spores dark brown, obovate or not infrequently globose, more or less rounded, angular, $19-26 \times 25-31 \mu$, wall thick, slightly more so at the apex, papillate, strongly so on the upper half of the spore but less so on the lower half; pedicel hyaline 2.5-3 times the length of the spore, but fragile and usually breaking away near the spore.

On *Carex douglasii*, near Palmers, Mariposa County, June 22, 1894. (J. W. Congdon.) *Carex usta*, Bear Valley, San Bernardino County, Aug. 7, 1902. (L. R. Abrams, no. 2920.)

OHIO FUNGI. FASCICLE IX.

W. A. KELLERMAN, OHIO STATE UNIVERSITY.

List of Species and Hosts.

161. *Bovista plumbea* Pers.
162. *Cercospora helianthi* E. & E., on *Helianthus hirsutus* Raf.
163. *Coleosporium campanulae* (Pers.) Lév., on *Campanula americana* L.
164. *Elfvigia megaloma* (Lév.) Murrill, on stumps and logs.
165. *Entyloma menispermii* Farl. et Trel., on *Menispermum canadense* L.
166. *Melampsora salicis-capreae* (Pers.) Wint., on *Salix nigra* Marsh.
167. *Peronospora parasitica* (Pers.) DeBary, on *Dentaria laciniata* Muhl.
168. *Plasmopara sordida* Berk., on *Scrophularia marylandica* L.